

## Abstract

A valve plug design is disclosed that uses a plug head band and a retaining ring to restrain a valve plug head to a valve plug stem. This invention is specifically directed to providing valve plugs where the plug head material is different and distinct from the plug stem material and where each material is selected to optimize its performance.

Moreover, this invention is provided with a means for fixing and removing the plug head to and from the plug stem that can easily be worked in the field without special purpose manufacturing equipment, thereby making the maintenance, repair and replacement of plug head easier for users. This valve plug design subjects the plug head to reduced stresses thereby enhances the operating life of the valve and valve plug. This valve plug design provides a shock absorbing, compliance barrier around and/or under the plug head. This invention also provides a more uniform and broadened contact surface between the plug head and the plug stem, further reducing mechanical stresses to the plug head. This plug head invention requires less material and thus leads to reduced manufacturing costs and does not require welding to fasten the plug head to the plug stem, thereby permitting heat treatments as required without adverse impacts to the plug head to plug stem joint. Also, this invention is adapted to function in cooperation sensors embedded at the plug head – valve plug stem interface to permit the monitoring of alignment stresses on the valve plug head.